What is claimed:

1. A method of producing a lactosamine derivative with β1-4 linkage, said method comprising

(1) reacting

(a) at least one donor substance GalβOR where R is an organic group, and

(b) at least one acceptor substance which is a glucopyranosamino derivative having the formula GlcNR''-R''',

wherein NR'' is an azido, 2-N-acetyl-, 2-N-phthalimido, or another compound containing an inorganic and/or organic group bound to the 2-N-group of glucosamine,

wherein R''' is a glycosidically bound fluoro or is an O-, C-, N- or S-glycosidically bound aliphatic or aromatic compound,

with the proviso that if NR'' is NHAc then R''' is not OH and if NR'' is not NHAc then R''' may be OH,

(c) in the presence of *Bullera singularis* or an E.C. group 3.2 glycosidase of essentially the same structure as an E.C. Group 3.2 glycosidase obtained from *Bullera singularis* to form said lactosamine derivative; and

(2) optionally isolating said lactosamine derivative.

2. The method according to claim 1, wherein said organic group in said donor substance GalβOR is selected from the group consisting of a sugar, a lower alkyl group, and an aromatic group.

3. The method according to claim 2, wherein said sugar is glucose, wherein said lower alkyl group is methyl or ethyl, and wherein said aromatic group is phenyl or nitrophenyl.

4. The method according to claim 3, wherein said sugar is glucose and wherein said aromatic group is nitrophenyl.

5. The method according to claim 1, wherein said R''' is a lower alkoxy, lower thioalkyl, thioaromatic, -OEtBr or nitorphenoxy.

6. The method according to claim 5, wherein said lower alkoxy is methyloxy or ethyloxy, wherein said lower thioalkyl is β-linked thioethyl, and wherein said thioaromatic is thiophenyl.

7. The method according to claim 1, wherein said NR'' is N-phthalimido, NH-C(O)-R, NHR or NRR' where R and R' are a group containing an organic and/or group.

8. The method according to claim 7, wherein R and R' are a group containing an aliphatic and/or aromatic group.

9. The method according to claim 8, wherein said aliphatic group is a alkyl, alkoxy, or allyloxy and wherein said aromatic group is phenyl, benzyl or phenyloxy.

10. The method according to claim 9, wherein said lower alkyl is methyl, ethyl or propyl and said lower alkoxy is methoxy or ethoxy.

11. The method according to claim 1, wherein said NR'' is N-phthalimido, azido or N-acetyl.

12. The method according to claim 1, wherein said lactosamine derivative is Galβ1-4GlcNPhtβ-SEt, Galβ1-4GlcNPhtβ-OMe, Galβ1-4GlcNPht, Galβ1-4GlcN$_3$β-OMe, Galβ1-4GlcNAcβ-SEt, or Galβ1-4GlcNAcβ-OPhNO$_2$-p.

13. The method according to claim 1, wherein said method further comprises adding a second enzyme which specifically removes glucose.

14. The method according to claim 13, wherein said second enzyme is an isomerase or an oxidase.

15. The method according to claim 14, wherein said isomerase is glucose isomerase.

16. The method according to claim 1, wherein said step (c) utilizes *Bullera singularis* to form said lactosamine derivative.

17. The method according to claim 1, wherein said step (c) utilizes an E.C. group 3.2 glycosidase of the same structure or of a similar structure as the E.C. group 3.2 glycosidase obtained from *Bullera singularis* to form said lactosamine derivative.

18. The method according to claim 1, wherein said step (c) utilizes a soluble or immobilized preparation containing crude, partially isolated or isolated β-galactosidase from *Bullera singularis* or from a recombinant cell or organism.

19. The method according to claim 1, wherein said step (c) utilizes a recombinant β-galactosidase having at least 70% homology with the amino acid sequence of the β-galactosidase of *Bullera singularis*.

20. The method according to claim 1 wherein said glycosidase is immobilized via precipitation, adsorption, enclosure, chelation, or covalent bonding, to a polymeric substance or derivative thereof which is insoluble in protic or aprotic solvents.

21. The method according to claim 20, wherein said polymeric substance is a polysaccharide, a plastic, or a glass, and which has been activated and contains reactive groups selected from the group consisting of cyanate, organic sulphonates, aldehyde, diazonium, epoxy, divinylsulphone, and triazine groups.

22. The method according to claim 21, wherein said polysaccharide is cellulose or agarose and said plastic is polyacrylamide, polyvinylalcohol, or polystyrene.

23. A lactosamine derivative with β1-4 linkage produced by the method according to claim 1.

24. A method for the production of Lexis-x and derivatives thereof, said method comprising peracetylating the lactosamine derivative with β1-4 linkage produced by the method according to claim 1 to form a peracetlyated compound, reacting said peracetlyated compound with a fucopyranosyl compound and subsequently removing the R groups and acetylating the NH_2 group.

25. The method according to claim 25, wherein the R groups are acetyl and phthalimido.